Chapter 6
Cost Analysis

A cost analysis of the use of Torbo®-Blastox® and Torbo®-PreTox 2000 technology combinations to remove lead-based paint from wood and brick substrates is based on field data from the actual test demonstrations. The cost analysis is limited to the determination of present value savings (i.e., in immediate real dollar terms).

Tables 21 and 22 present summary data from the separate cost analyses of the wood and brick substrates. Different equipment is required for the various structures (one-story wood structures vs. 28-ft-high brick wall), thereby affecting contractor overhead and the type of access equipment used. Furthermore, both the amount of blast media per square foot and the rate of removal (ft^2/hour) vary depending on the type of substrate.

Cost factors presented in the tables are based on actual contractor cost and are compared to actual government estimates from site-specific lead-based paint abatement projects. Note that these cost are highly variable and depend on local conditions; the data in Tables 21 and 22 are intended to be taken as a guide. The term "capital facilities" refers to the capital investment in the technology (Torbo® blasting system). Labor is quoted from actual contractor costs or derived from government estimate sheets. Consumables include the blast media, blast media additive (Blastox®), surface coating preparation (PreTox 2000), personal protective clothing and equipment, tarps and covers, and packaging required for disposal as a hazardous or non-hazardous waste. Environmental testing includes required tests such as air monitoring (personal and site), XRF testing, and TCLP waste characterization.

Table 21. Cost Analysis for Removal of Lead-Based Paint from Wood Substrate

Cost Factors	Torbo® without Stabilization Technology	Torbo® with Stabilization Technology	
		Blastox® (30 % Blend)	PreTox 2000 (40-mil wet thickness)
Capital Facilities[a]	$7.14/site hour	$7.14/site hour	$7.14/site hour
Equipment Rental[b]	$30.00/site hour	$30.00/site hour	$30.00/site hour
Labor[c]	$46.00/site hour	$46.00/site hour	$46.00/site hour
Consumables[d]	$13.62/site hour	$13.72/site hour	$14.09/site hour
Environmental Testing[e]	$49.00/site hour	$49.00/site hour	$49.00/site hour
Subtotal	$145.76/site hour	$145.87/site hour	$146.27/site hour
Removal Rate	83 ft^2/hour	83 ft^2/hour	71 ft^2/hour
Removal Cost	$1.76 /$ft^2$	$1.76 /$ft^2$	$2.06/$ft^2$
Disposal Cost[f]	$0.29/$ft^2$ ($250/ton)	$0.29/$ft^2$ ($250/ton)	$0.29/$ft^2$ ($250/ton)
Total Cost	$2.05/$ft^2$	$2.05/$ft^2$	$2.35/$ft^2$
Non-Hazardous Disposal	N/A	$0.04/$ft^2$ ($35/ton)	$0.04/$ft^2$ ($35/ton)
Non-Hazardous Total Cost	N/A	$1.80 /$ft^2$	$2.10 /$ft^2$

[a] Capital rates of recovery are from actual contractor costs and DEH government cost estimate detail sheets. Costs for investment are amortized over 7 years for depreciation, and assume a 2000-hour site year.

[b] Includes construction fork lifts for handling of materials, man lifts for site access, and PreTox 2000 spray application equipment (as applicable).

[c] Site personnel labor cost. Labor is quoted from actual contractor costs or derived from government estimate sheets.

[d] Consumables are based on items used up in the demonstration. Blastox®: 29 (100-lb) bags of abrasive (coal slag and 20% Blastox® additive) were used resulting in 2.72 lb of abrasive mixture per ft^2 of surface area blasted. PreTox 2000: 38 (100-lb) bags of abrasive (coal slag) were used to remove 40-mil (wet) thickness application of PreTox 2000 resulting in 3.42 lb of abrasive per ft^2 of surface area blasted. The application of 40-mil (wet) thickness on 1,112 ft^2 required six 5-gallon containers of PreTox 2000.

[e] Environmental testing includes air monitoring (6 personal and 23 site perimeter), TCLP (12 abrasive media debris), and XRF ($50/site hour).

[f] Actual transportation and disposal costs.

Table 22. Cost Analysis for Removal of Lead-Based Paint from Brick Substrate

Cost Factors	Torbo® without Stabilization Technology	Torbo® with Stabilization Technology	
		Blastox® (30% Blend)	PreTox 2000 (40-mil wet thickness)
Capital Facilities[a]	$7.14/site hour	$7.14/site hour	$7.14/site hour
Equipment Rental[b]	$30.00/site hour	$30.00/site hour	$30.00/site hour
Labor[c]	$46.00/site hour	$46.00/site hour	$46.00/site hour
Consumables[d]	$16.28/site hour	$16.38/site hour	$16.75/site hour
Environmental Testing[e]	$49.00/site hour	$49.00/site hour	$49.00/site hour
Subtotal	$148.42/site hour	$148.52/site hour	$148.93/site hour
Removal Rate	119 ft^2/hour	119 ft^2/hour	121 ft^2/hour
Removal Cost	$1.25/$ft^2$	$1.25/$ft^2$	$1.23/$ft^2$
Disposal Cost[f]	$0.29/$ft^2$ ($250/ton)	$0.29/$ft^2$ ($250/ton)	$0.29/$ft^2$ ($250/ton)
Total Cost	$1.54/sq ft	$1.54/sq ft	$1.52/sq ft
Non-Hazardous Disposal	N/A	$0.04/$ft^2$ ($35/ton)	$0.04/$ft^2$ ($35/ton)
Non-Hazardous Total Cost	N/A	$1.29/$ft^2$	$1.27/$ft^2$

[a] Capital rates of recovery are from actual contractor costs and DEH government cost estimate detail sheets. Costs for investment are amortized over 7 years for depreciation, and assume a 2000 hour site year.

[b] Includes construction fork lifts for handling of materials, man lifts for site access, and PreTox 2000 spray application equipment (as applicable).

[c] Site personnel labor cost. Labor is quoted from actual contractor costs or derived from government estimate sheets.

[d] Consumables are based on items used up in the demonstration. Blastox®: 46 (100-lb) bags of abrasive (mineral sand and 15% Blastox® additive) were used resulting in 2.33 lb of abrasive mixture per ft^2 of surface area blasted. PreTox 2000: 46 (100-lb) bags of abrasive (mineral sand) were used to remove 40 mil (wet) thickness application of PreTox 2000 resulting in 2.56 lb of abrasive per ft^2 of surface area blasted. The application of 40 mil (wet) thickness on 1,1796 ft^2 required ten 5-gallon containers of PreTox 2000.

[e] Environmental testing includes air monitoring (11 personal and 34 site perimeter), TCLP (12 abrasive media debris), and XRF ($50/site hour).

[f] Actual transportation and disposal costs.